Diabetes

Comparison of arterial stiffness parameters in patients with coronary artery disease and diabetes mellitus using Arteriograph

Lenkey Z, Illyés M, Böcskei R, Husznai R, Sárszegi Z, Meiszterics Z, Molnár FT, Hild G, Szabados S, Cziráki A, Gaszner B.

BACKGROUND: Recently an expert consensus document advised to standardize user procedures and a new cut-off value for carotid-femoral pulse wave velocity in daily practice.

PATIENTS AND METHODS: Our aim was to observe aortic pulse wave velocity (PWVao) and augmentation index (AIXao) in two high cardiovascular risk groups: patients with verified coronary artery disease (CAD) or with type 2 diabetes mellitus (T2DM). We also aimed to determine the cut-off values for PWVao, AIXao in CAD and T2DM patients using oscillometric device (Arteriograph). We investigated 186 CAD and 152 T2DM patients.

RESULTS: PWVao and AIXao increased significantly in the CAD group compared to the age-, gender-, blood pressure-, and heart rate-matched control group (10.2+/-2.3 vs. 9.3+/-1.5 m/s; $p<0.001$ and 34.9+/-14.6 vs. 31.9+/-12.8 %; $p<0.05$, respectively). When compared to the apparently healthy control subjects, T2DM patients had significantly elevated PWVao (9.7+/-1.7 vs. 9.3+/-1.5 m/s; $p<0.05$, respectively), however the AIXao did not differ significantly. The ROC-curves of CAD and healthy control subjects explored cut-off values of 10.2 m/s for PWVao and 33.23 % for AIXao.

CONCLUSIONS: Our data provide supporting evidence about impaired arterial stiffness parameters in CAD and T2DM. Our findings encourage the implementation of arterial stiffness measurements by oscillometric method in daily clinical routine.

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24-h ambulatory pulse wave velocity and central blood pressure in type 2 diabetes

Krogager C, Rossen NB, Laugesen E, Knudsen ST, Poulsen PL, Hansen KW

BACKGROUND: Pulse wave analysis from a brachial cuff permits ambulatory measurements of pulse wave velocity (PWV) and central blood pressure parameters. The diurnal variation of PWV in type 2 diabetes is unknown.

METHODS: We evaluated the Arteriograph24 which is a brachial cuff based equipment for estimating

PWV and central blood pressure data without the use of a transfer function, in 22 type 2 diabetic patients, who had two 24 h measurements performed.

RESULTS: The mean number of valid day time and nighttime measurements were 29 (range 16-50) and 18 (11-25), respectively. 21 patients had at least one qualifying report. Nighttime PWV was significantly lower than during the day (9.1 vs. 9.7 ± 0.8 mm/s, $p < 0.01$). Systolic aortic blood pressure was 6 mmHg lower than brachial blood pressure in the day time ($p < 0.01$) and 4 mmHg lower during the night ($p < 0.05$). Each single measurement was standardized with the 24 h average as reference thus generating data from 1004 paired observations.The standardized PWV correlated with standardized values of heart rate ($r = 0.24$, $p < 0.001$) and systolic aorta blood pressure ($r = 0.20$, $p < 0.001$). A stepwise multiple regression model with standardized pulse wave velocity as dependent variable included standardized heart rate, systolic aorta blood pressure and a dummy variable for day/night status ($R^2 = 0.091$, $p < 0.001$).

CONCLUSION: The Arteriograph24 is applicable for research purpose. PVW in type 2 diabetes is modestly reduced during the night. The intraindividual variation of heart rate contributed independently to the variation of PWV.

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